Underwater Munitions Wide Area Assessment
Vieques, Puerto Rico

Presented By
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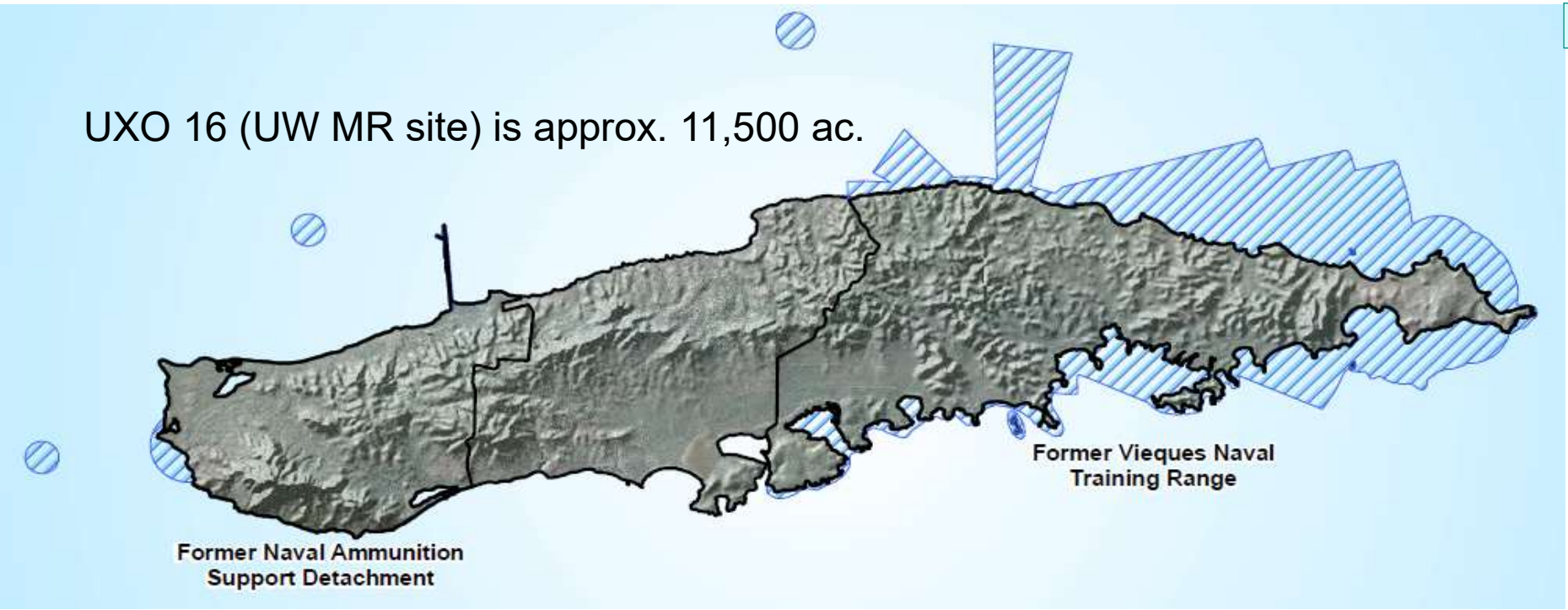
Overview

- Background/Overall Objective
- Wide Area Assessment (WAA) objectives
- Where WAA fits into the CERCLA process
- Data collection
- Results
- Path forward

Background/Overall Objective

- **Overall Goal is to efficiently and cost-effectively evaluate munitions associated with the underwater MR site to facilitate remedial decisions**

KRC1



Slide 3

KRC1 Kevin Cloe, 11/16/2017

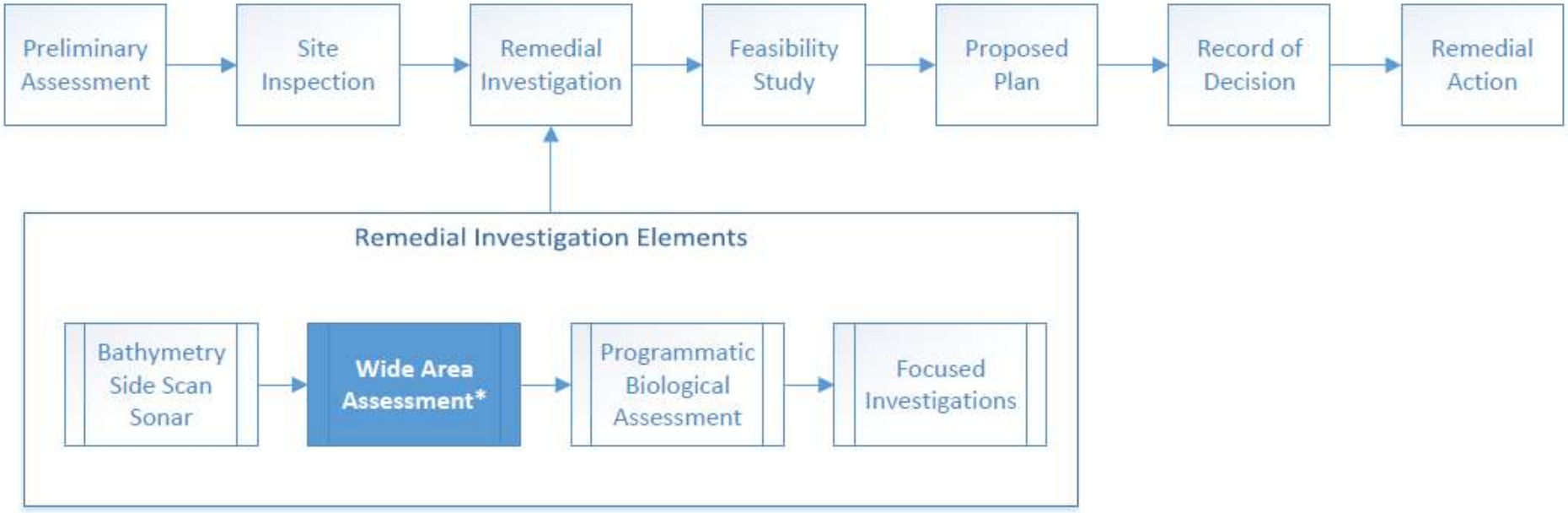
WAA Objectives

- **Primary: Identify elevated anomaly density areas (EADAs) within UXO-16, which may represent munitions**

- **Secondary: Collect information for a Biological Assessment to protect key marine species and habitats during follow-up investigations and actions**

WAA in the CERCLA Process

- **The WAA is the initial, broad evaluation of the nature and extent of underwater munitions**



* Wide Area Assessment information also used in feasibility study, remedial action, and LTM

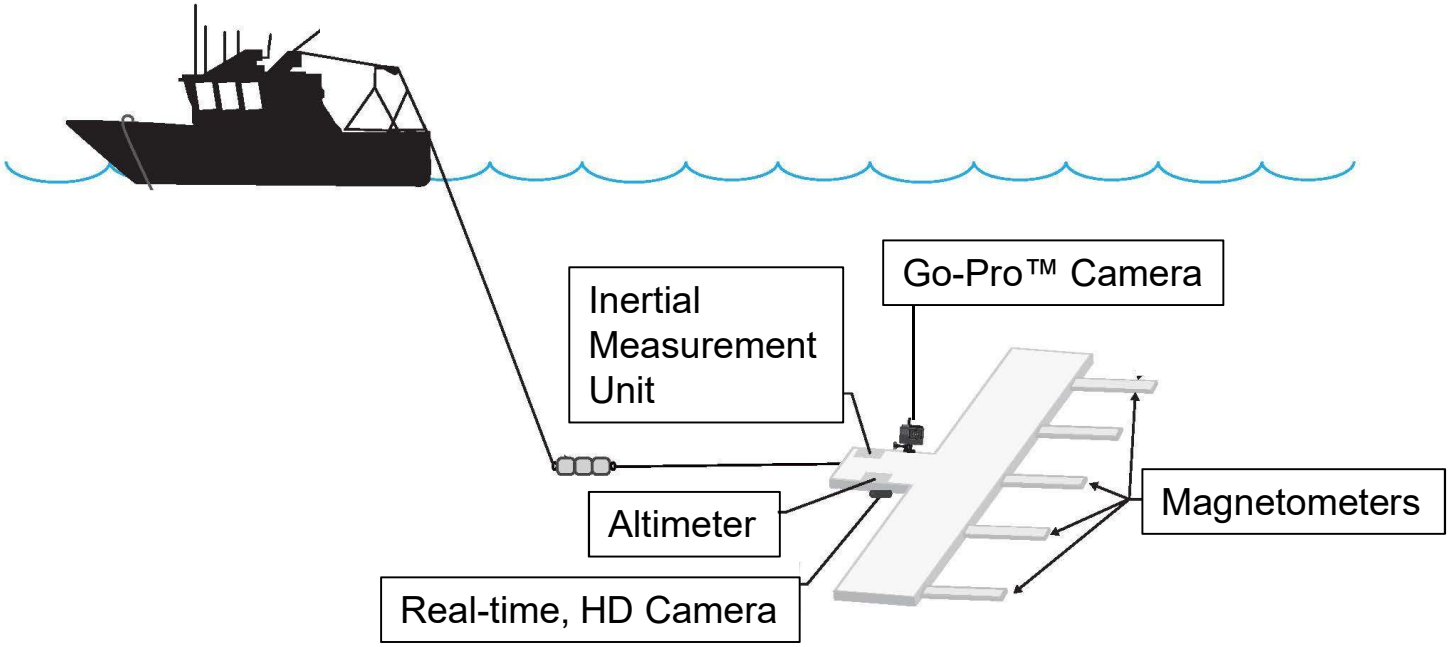
WAA Capabilities

- **WAA can:**
  - **Identify areas of large concentrated munitions use/presence**
  - **Verify the Conceptual Site Model**
  - **Help divide a large munitions response area into smaller munitions response sites**
  - **Help prioritize munitions response sites for follow-up investigation/action**
  - **Provide key data for the feasibility study alternatives and costs, as well as the remedial action and associated long-term monitoring**

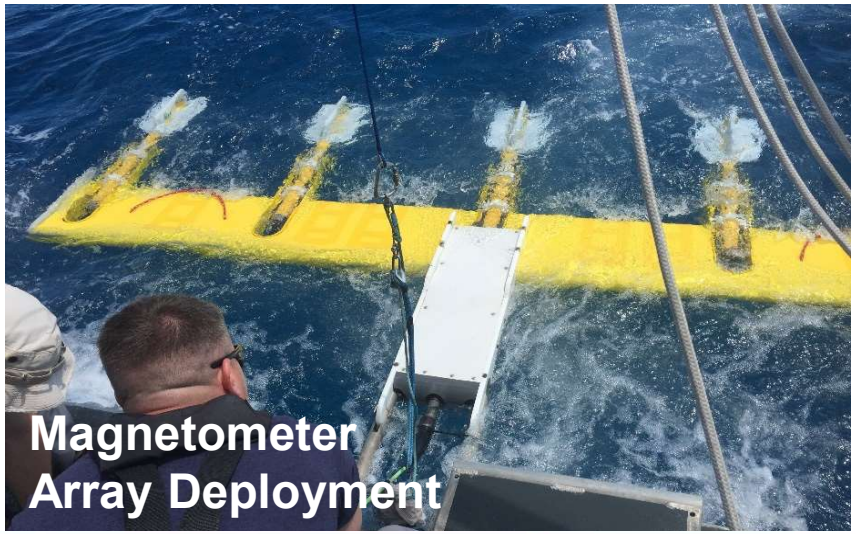
- **WAA does <u>not</u>:**
  - **Identify individual or small areas of clustered munitions**
  - **Characterize munitions constituents (MC)**

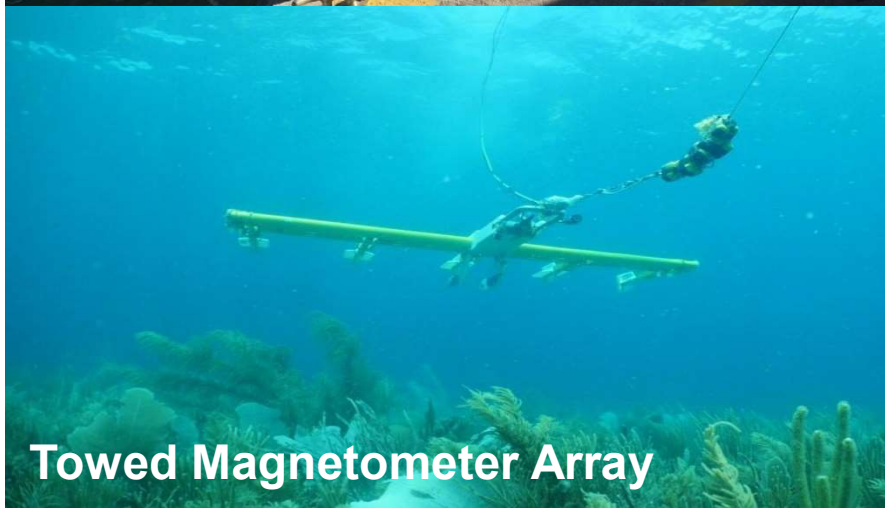
Technology Description

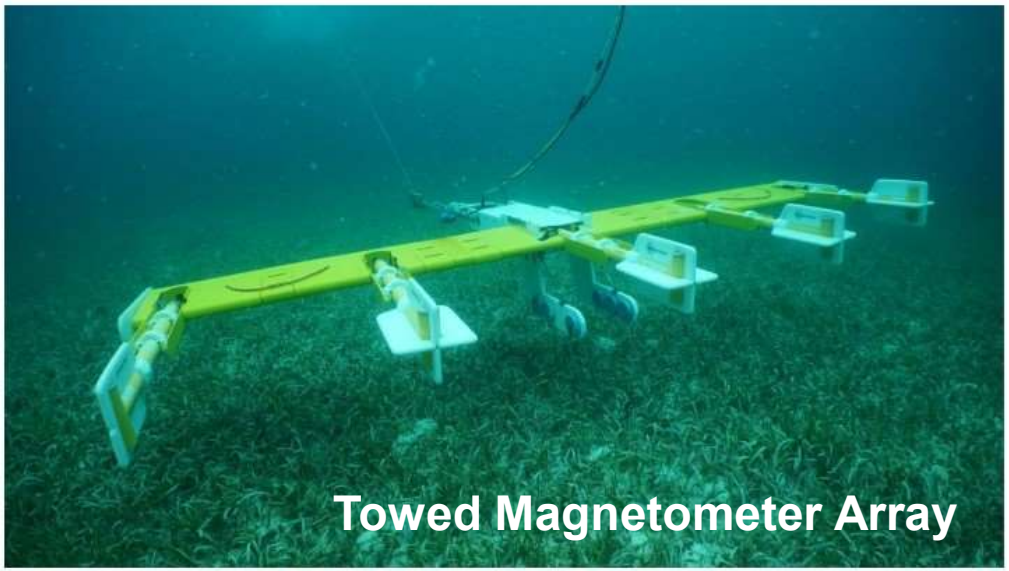
- **Towed magnetometer array ("wing")**
- **Global positioning system for positional data**
- **Underwater video cameras for bottom surface features (bottom type, ecology, habitats, munitions, debris)**



WAA Equipment



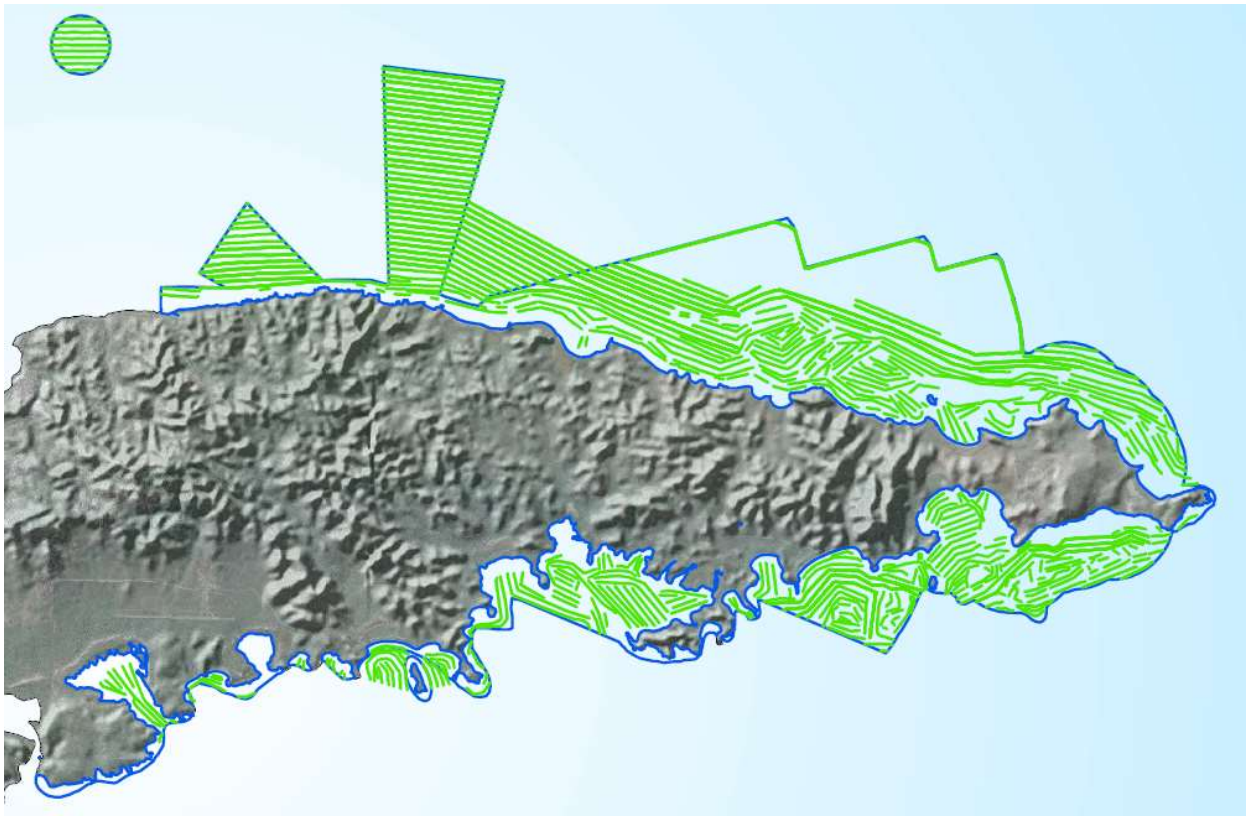




WAA Equipment

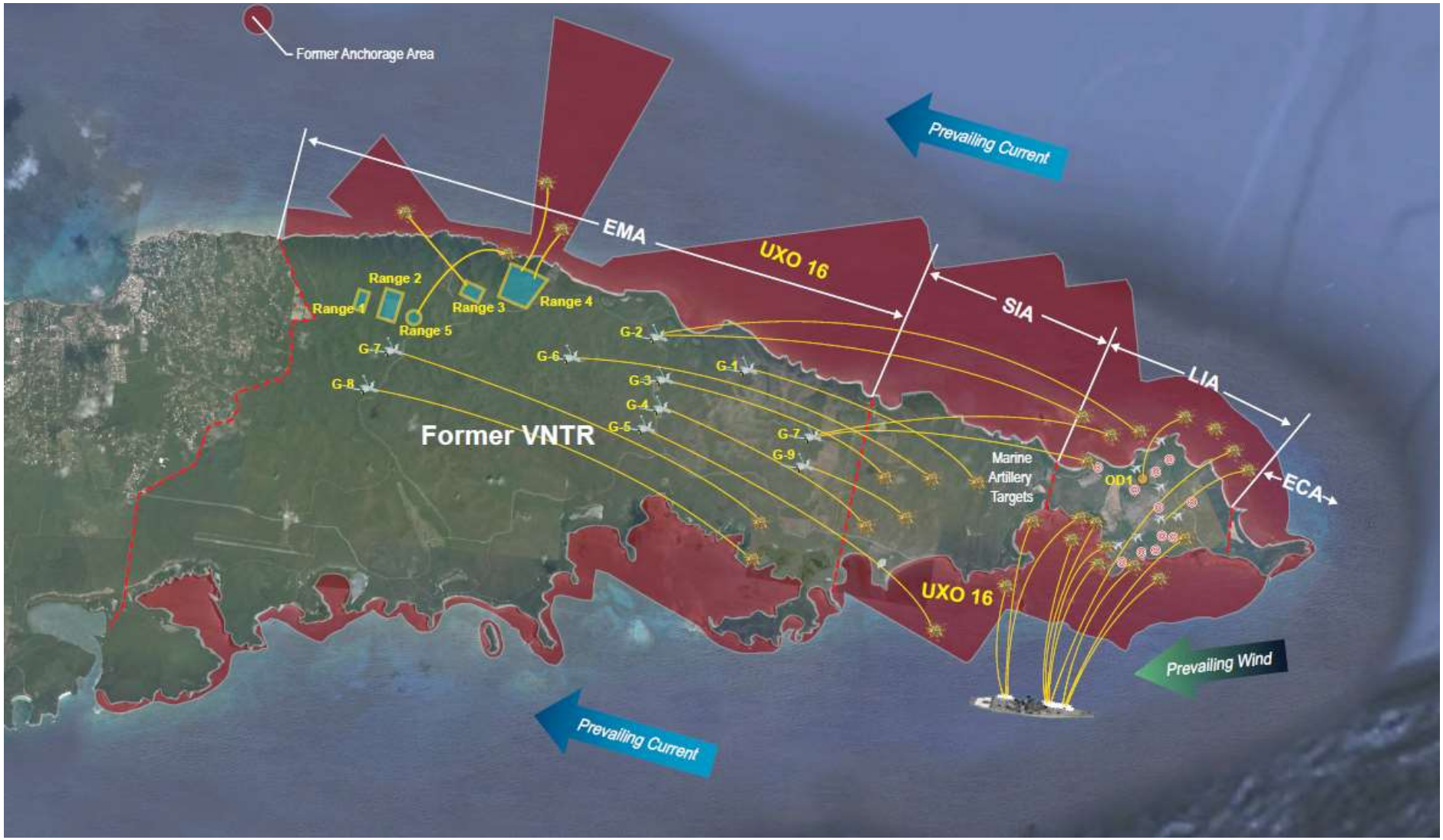
Data Collection

- Utilized Visual Sample Plan (VSP) for survey design
- 300-ft transect spacing (~5%)
- Wing towed ~3 ft above sea floor
- 208 miles of transects
- Water depths from ~3 ft to ~80 ft
- Continuous video along transects

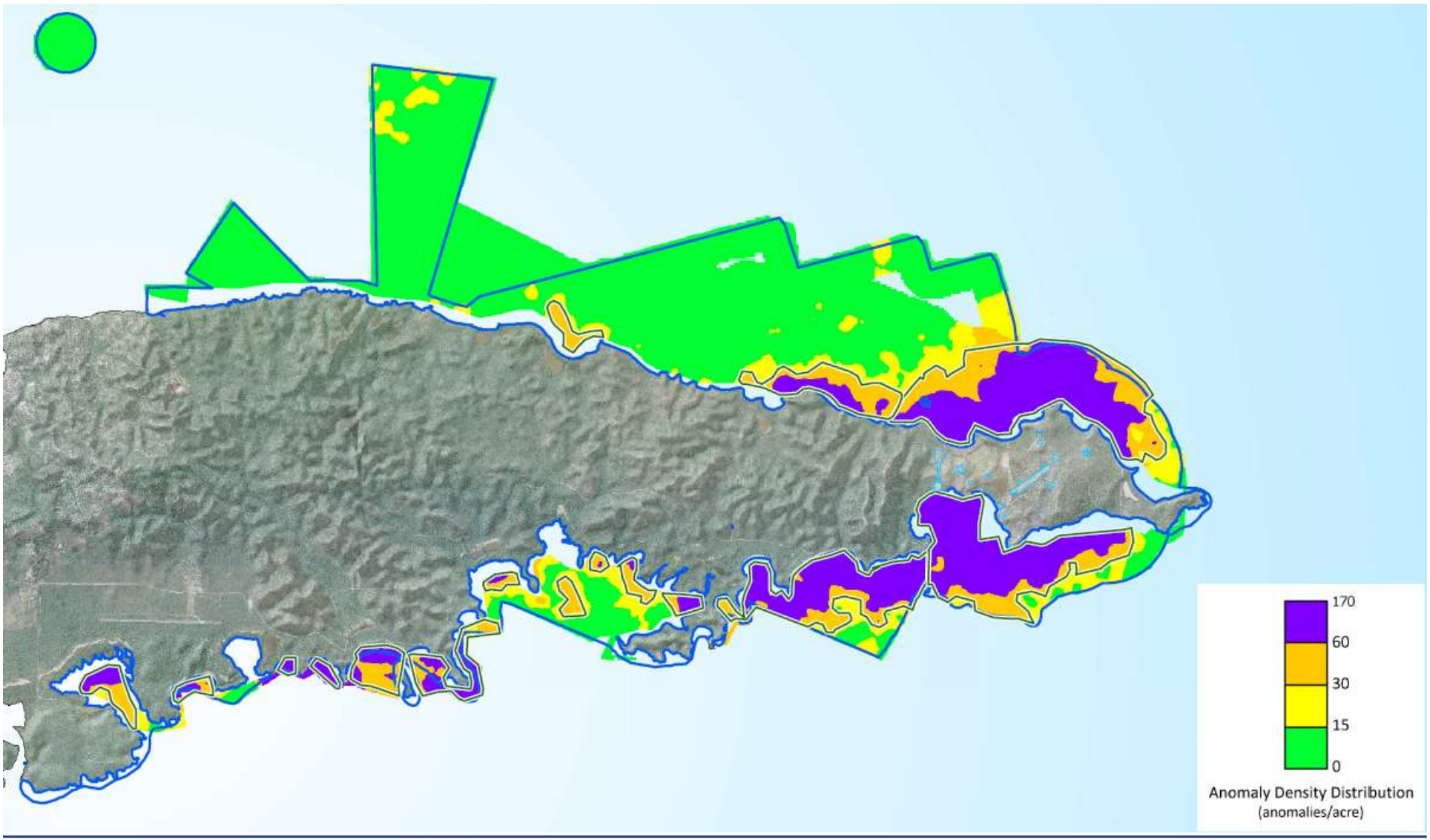


- Coordinates of munitions observed on seafloor

Conceptual Site Model



WAA Results

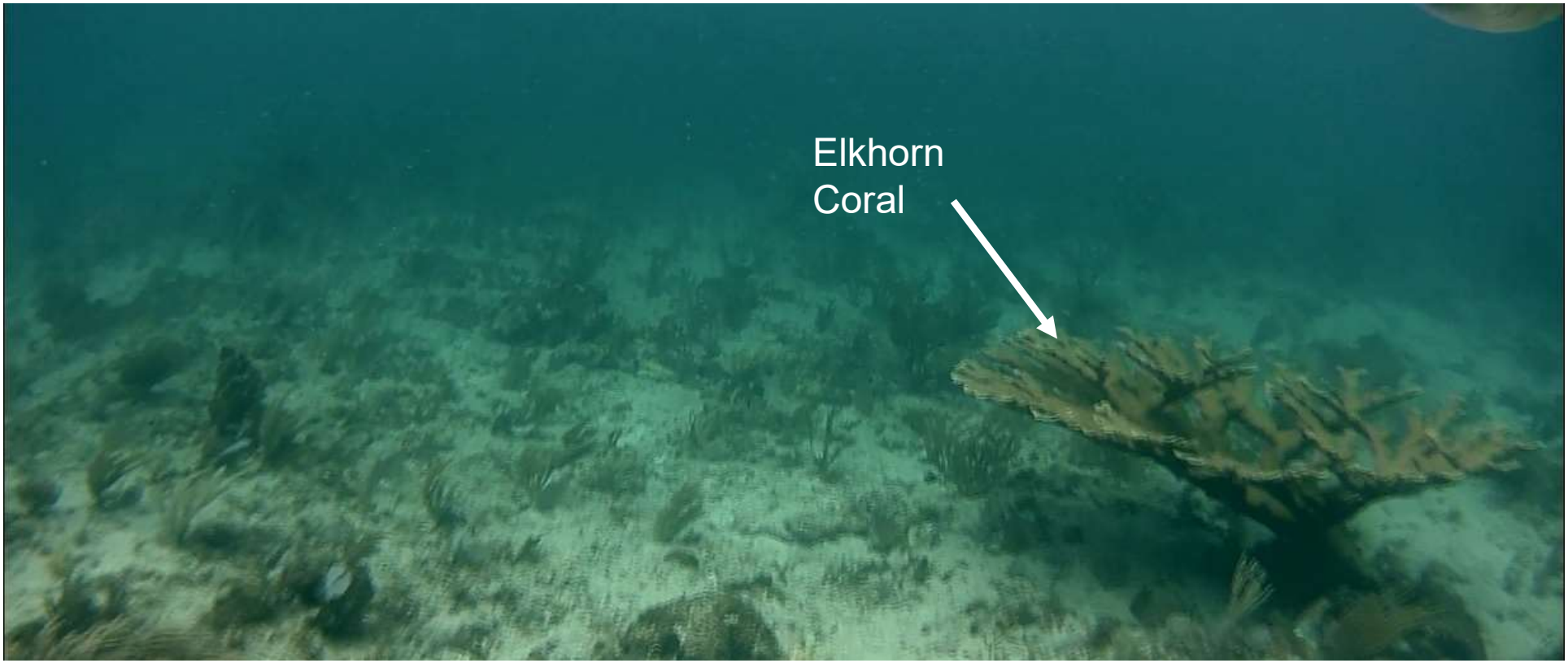


Munitions Proud on Seafloor

Munitions Proud on Seafloor

Munitions with Soft Corals

Protected Coral Species



Key Findings

- **EADA distribution is generally consistent with Conceptual Site Model**
- **Several EADAs in unexpected areas (where recreational boats are anchored); may represent general trash and/or debris associated with recreational and/or commercial activities based on locations**
- **EADA distribution vs observations of proud munitions suggest most munitions are buried**
- **Video significantly enhances ability to prepare Biological Assessment**

Lessons Learned/Summary

- Pre-WAA bathymetry and side-scan sonar survey help plan tow routes and avoid obstacles
- Use of forward facing/real-time video is necessary to avoid contact with bottom structures, such as coral
- Test the tow configuration in an open, sandy area
- Ensure tow vessel is compatible with water conditions
- Factor weather and mechanical delays into schedule- they will occur!!
- Consider boat/equipment security at mooring location
- Coordinate Instrument Verification Strip (IVS) and data collection locations to minimize boat transit time

Path Forward

- Update Conceptual Site Model
- Prepare programmatic (site-wide) biological assessment and associated protective protocols
  - Cost-effective/time-effective vs multiple, location-specific biological assessments
- Subdivide and prioritize areas within UXO 16 for:
  - Focused investigations, potentially including additional WAA where EADAs intersect site boundary
  - Decisions
  - Actions

Test Questions

- **Is the WAA purpose to Identify individual or small areas of clustered munitions? True or False**
- **Will the WAA help prioritize munitions response sites for follow-up investigation/action? True or False**
- **Will the WAA provide key data for the feasibility study alternatives and costs, as well as the remedial action and associated long-term monitoring? True or False**

Points of Contact:

Email address/phone number available on global address list

- **NAVFAC Atlantic:** Kevin Cloe, Daniel Hood, Dan Waddill

Questions?